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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/954,947	09/18/2001	Josef Steining	13322US01	8515

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Dean D. Small
 McAndrews, Held & Malloy, Ltd.
 34th Floor
 500 W. Madison Street
 Chicago, IL 60661

EXAMINER

JUNG, WILLIAM C

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/954,947	Applicant(s) STEININGER ET AL.	
	Examiner William Jung	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-21 and 23-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-21 and 23-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>23042004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed April 23, 2004 have been fully considered but they are not persuasive.

In regards to claims 1, 3, 13, 16, 21, and 23: The applicant's amendment and argument in remarks reflect that the claimed invention in claims 1, 3, 13, 16, 21, and 23 are distinguished from the prior arts Mochizuchi et al in view of Okunuki et al cited in previous Office Action dated February 25, 2004. The applicant remarked that the aforementioned amended claims comprises a rotational control device activating said stepper motor to rotate said transducer array a predetermined angle for each activation of said device, said predetermined angle greater than an incremental step angle of said stepper motor. Although, the prior art, Okunuki et al does not specifically disclose predetermined angle greater than the incremental step, the stepper motor is limited by the increment of the step, i.e. the increment step is the minimum angle the user can change. Therefore, rotating the motor by greater than one increment of the stepper motor inherently anticipates the limitation of the claim where the selected change in angle is greater than the incremental step angle.

In regards to claims 1, 3, 5, 6, 9, 13, 15-17, 21, 23, 25, 26, and 29, the applicant argued that Mochizuchi et al and Okunuki et al do not disclose all claimed elements. Mochizuki et al teaches sweeping motion of the ultrasound transducer but not the specific control. In Okunuki et al, the state of the art at the time the invention was made the control transducer pivoting by using stepper motor was well known to control the sweeping motion of the ultrasound transducer such as Mochizuki et al. In addition to discussion above regarding a rotational control device

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activating said stepper motor to rotate said transducer array a predetermined angle for each activation of said device, said predetermined angle greater than an incremental step angle of said stepper motor, all claimed limitations in claims 1, 3, 5, 6, 9, 13, 15-17, 21, 23, 25, 26, and 29 are met with Mochizuchi et al and Okunuki et al.

In regard to claims 4 and 24; and 10-12, 14, and 30-32, the applicant argued that the Cerofolini does not teach type of handcrank to control the pivoting of the transducer. The examiner views the control knob in Cerofolini's device where the knob can be rotated is analogous to the handcrank. In either rotating knob or handcrank, the rotation of the control device has same mechanical control and motion to rotate the gear controlling the transducer. Therefore, Cerofolini teaches the elements in the claims. Moreover, Mochizuki et al teaches sweeping motion of the ultrasound transducer but not the specific control. In Cerofolini, the state of the art at the time the invention was made the control by knob or crank is well known to control the sweeping motion of the ultrasound transducer. Therefore, the combination of Mochizuki et al and Cerofolini covers all elements of claims 4 and 24.

In regards to claims 7, 8, 19, 20, 27, and 28, the applicant argued that Mochizuchi et al and Okunuki et al's deficiency in magnetic sensing device is not being taught by Angelsen. However, the examiner would like to point to col. 2, lines 4-24 and col. 3, line 64 – col. 4, line 51, where Angelsen specifically teaches that magnetic sensor is used to determine the position of the transducer and the magnetic field is used to control the transducer position. Therefore, all claimed elements in 7, 8, 19, 20, 27, and 28 are met.

The examiner holds the rejection based on previous Office Action, which is restated below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3, 5, 6, 9, 13, 15-17, 21, 23, 25, 26, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Mochizuki et al* (US 5,152,294) in view of *Okunuki et al* (US 5,460,179).

Claims 1, 3, 9, 13, 16, 21, 23, and 29 Mochizuki et al substantially discloses all of claimed invention in claims 1, 3, 9, 13, 16, 21, 23, and 29. Mochizuki et al discloses an ultrasonic probe where the region of interest is imaged with ultrasound probe consisting of a probe housing 22 with the transducer array 28 pivotally attached within the probe housing. The transducer array is capable of rotating about the central scan plane as shown in figure 3 with the transducer rotation range, the transducer 28A is parallel to the longitudinal axis of the probe. The rotating or sweeping motion of the transducer array is controlled by a motor to form a volumetric or 3D scan consisting of a series of oblique scan plane S oriented at an desired angle increment (col. 2, lines 16-46; col. 3, lines 23-66; figures 2-4). However, Mochizuki et al do not disclose stepper motor control with drive belt or gear. Okunuki et al teaches that the stepper motor control to change the angle of the transducer array is as in Mochizuki et al's ultrasonic probe; i.e. belt 52 and gear 50 to the motor 48 to turn the pivotally mounted transducer 28 about the pivoting axis 32 (col. 6, line 12- col. 8, line 60). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to improve the rotational

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element of the probe of Mochizuki et al with Okunuki et al because Okunuki et al teaches the control of the stepper motor disposed in the housing with belt and gear coupled to the drive shaft to achieve pivotal rotation.

Claims 5, 6, 15, 17, 18, 25, and 26: Mochizuki et al further discloses of stepper motor described above as being a stepper motor and photo or optic sensor to control the angle of the transducer array (col. 3, line 67 – col. 4, line 29).

4. Claims 4 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Mochizuki et al* her in view of *Cerofolini* (US 5,740,804).

Mochizuki et al substantially discloses of all claimed invention in claims 4 and 24. Mochizuki et al discloses of an ultrasonic probe where the region of interest is imaged with ultrasound probe consisting of a probe housing 22 with the transducer array 28 pivotally attached within the probe housing. The transducer array is capable of rotating about the central scan plane as shown in figure 3 with the transducer rotation range, the transducer 28A is parallel to the longitudinal axis of the probe. The swinging or sweeping motion of the transducer array is control by a motor to form a volumetric or 3D scan consisting of series of oblique scan plane S oriented at an desired angle increment (col. 2, lines 16-46; col. 3, lines 23-66; figures 2-4). However, Muchizuchi et al do not disclose of handcrank operation to control the stepper motor. Cerofolini further teaches that the rotatable transducer array 56 pivoting about a central axis 31 at predetermined angle and control via stepper motor and hand crank 64 (figures 1 and 4; col. 5, lines 18-36; col. 4, lines 21-48). Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to improve Mochizuki et al's control of the rotational element via manual hand crank as taught by Cerofolini.

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5. Claims 7, 8, 19, 20, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Mochizuki et al* and *Okunuki et al* as applied to claims 1, 13, and 21 above, and further in view of *Angelsen* (US 4,757,818).

Mochizuki et al and Okunuki et al substantially discloses of all claimed invention in claims 7, 8, 19, 20, 27, and 28. However, Mochizuchi et al and Okunuki et al do not disclose of magnetic sensor for alignment. Angelsen further teaches that the rotating transducer array 230 about a pivoting axis 226 can be controlled with motor and the center alignment is controlled via magnetic sensor (col. 2, lines 4-24; col. 3, line 64 – col. 4, line 18). Therefore, it would have been obvious to one having an ordinary skill in the art at the time the invention was made to improve Mochizuki et al and Okunuki et al's control of the transducer rotation by using Angelsen's alignment control including magnetic sensor.

6. Claims 10, 11, 12, 14, and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Mochizuki et al* and *Okunuki et al* as applied to claims 1, 13, and 21 above, and further in view of *Cerofolini*.

Mochizuki et al and Okunuki et al substantially disclose of all claimed invention in claims 10, 11, 12, 14, and 30-32. However, Mochizuki et al and Okunuki et al do not disclose of use in endoscopic procedure. Claims 10, 11, 30, and 31: Cerofolini further teaches that the rotatable transducer array 56 pivoting about a central axis 31 at predetermined angle and control via stepper motor and hand crank 64 (figures 1 and 4; col. 5, lines 18-36; col. 4, lines 21-48). Claims 12, 14, and 32: Cerofolini also teaches that the probe device is design to be inserted into a patient via tracheal passage or body orifice, which would include endovaginal or rectal probe (col. 1, lines 21-39). Therefore, it would have been obvious to one having an ordinary skill in

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the art at the time the invention was made to improve Mochizuki et al and Okunuki et al's control of the transducer array rotation with Cerefolini's endoscopic or invasive catheter with ultrasound transducer.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William Jung whose telephone number is 571-272-4739. The examiner can normally be reached on Mon-Fri 8:30 AM to 5 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Eleni M. Mercader

Primary Examiner
Art Unit 3737


November 15, 2004